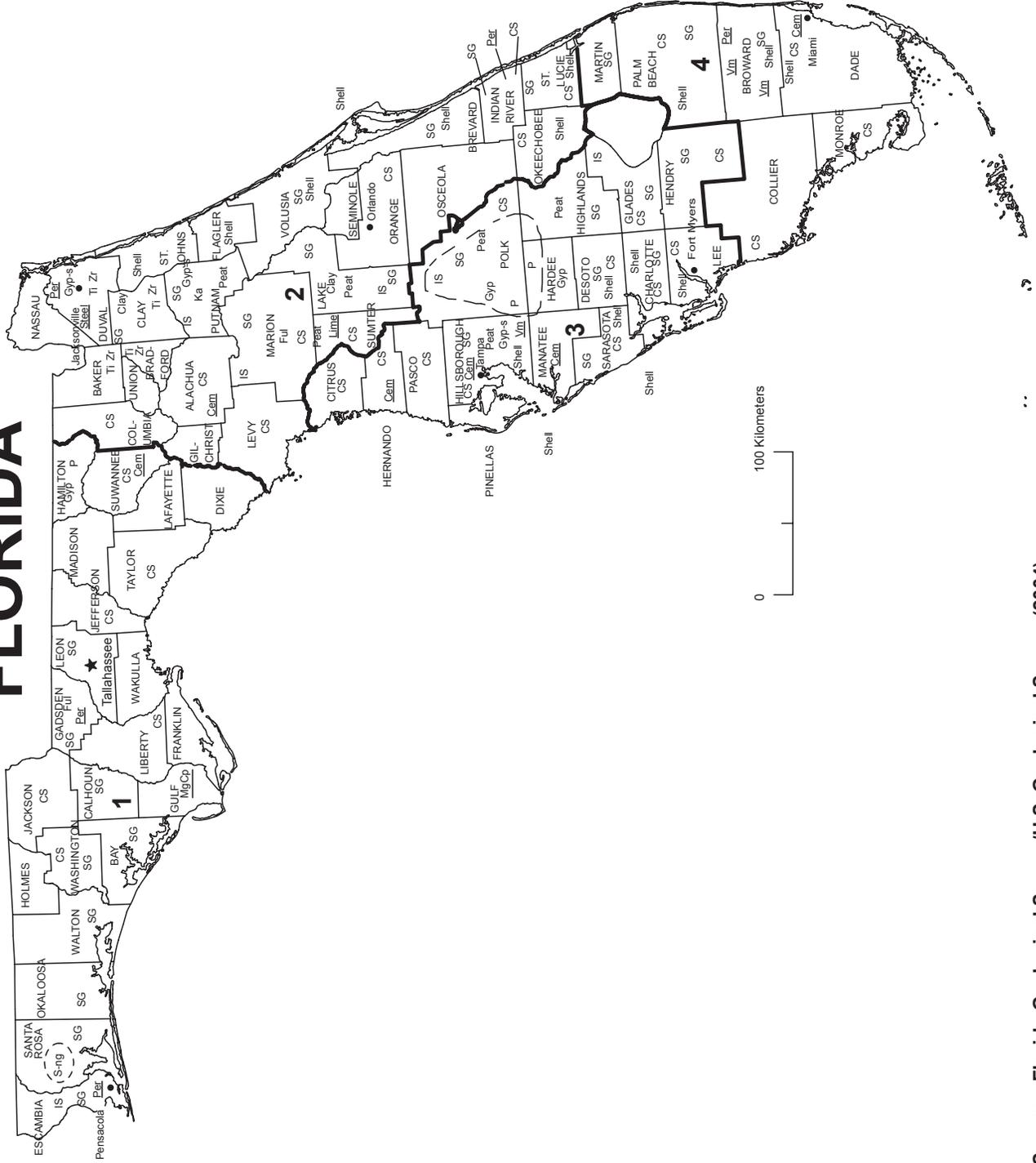


FLORIDA



LEGEND

- County boundary
- ★ Capital
- City

1 — Crushed stone/sand and gravel districts

MINERAL SYMBOLS (Major producing areas)

- Cem Cement plant
- Clay Common clay
- CS Crushed stone
- Ful Fuller's earth
- Gyp Gypsum
- Gyp-s Synthetic gypsum
- IS Industrial sand
- Ka Kaolin
- Lime Lime plant
- MgCp Magnesium compound plant
- P Phosphate rock
- Peat Peat
- Per Perlite plant
- S-ng Sulfur (natural gas)
- SG Construction sand and gravel
- Shell Shell
- Steel Steel plant
- Ti Titanium minerals
- Vm Vermiculite plant
- Zr Zirconium
- Concentration of mineral operations

THE MINERAL INDUSTRY OF FLORIDA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Geological Survey and the Florida Geological Survey for collecting information on all nonfuel minerals.

In 2004, Florida's nonfuel raw mineral production was valued¹ at \$2.32 billion, based upon annual U.S. Geological Survey (USGS) data. This was a 12.1% increase from that of 2003² and followed a 2% increase in value in 2003 from that of 2002. The State ranked fourth (fifth in 2003) among the 50 States in total nonfuel mineral production value, of which the State accounted for more than 5% of the U.S. total.

Florida continued to lead the Nation in phosphate rock mining in 2004 by producing more than six times as much as the State with the next highest production. Phosphate rock is produced in only four States. In terms of value, phosphate rock, crushed stone, cement (portland and masonry), and construction sand and gravel continued to be the most important raw nonfuel mineral commodities produced in Florida. The dollar value of these four mineral commodities and the next highest commodity, zirconium concentrates, represented about 94% of the State's total nonfuel mineral value.

In 2004, nearly all of Florida's nonfuel mineral commodities increased in value. Portland cement and crushed stone led the way with increases of \$109 million and \$83 million, followed by zirconium concentrates and masonry cement, up about \$15 million each, fuller's earth, up about \$9 million, and construction sand and gravel, up \$5 million. Smaller yet significant increases also took place in phosphate rock, peat, industrial sand and gravel, and magnesium compounds. Only rutile showed a decrease, down about \$3 million.

In 2003, the State's increase in value mainly resulted from increases in construction sand and gravel, up \$27 million, portland cement, up about \$26 million, and masonry cement and crushed stone, up about \$19 million each. These increases were partly offset by decreases in the values of phosphate rock, down about \$23 million, and fuller's earth and zirconium concentrates, down about \$9 million each. Smaller yet significant decreases also happened for peat, rutile, industrial sand and gravel, and magnesium compounds (descending order of change) (table 1).

In 2004, Florida continued to be the only State to process rutile and produce staurolite and remained first in the quantity of masonry cement, peat, and phosphate rock produced. While the State continued to be first of two States that produced zirconium concentrates and titanium mineral concentrates and third in crushed stone, it rose in rank to second from third in magnesium compounds, to fifth from seventh in fuller's earth, and to sixth from seventh in portland cement. Additionally, Florida produced significant quantities of construction and industrial sand and gravel.

The Florida Geological Survey³ (FGS) provided the following narrative information. Production and other data in the following text are those reported by the FGS, based upon that agency's own surveys and estimates. The FGS data may differ from some production figures reported to the USGS.

Employment

The Mine Safety and Health Administration (2004§⁴) reported that for calendar year 2004, 7,103 persons were employed in Florida's mining operations; this number does not take into account contractors that may be working for some operators. The crushed stone industry employed 3,307 workers, and the sand and gravel industry employed 2,626 workers, and the remainder of the workforce was employed by cement, clay, phosphate, and other operations.

Exploration and Development

Expansion of phosphate mining has been proposed in west-central Florida (Hardee and Manatee Counties), to the south in DeSoto County, and in northern Florida in Lafayette County, involving some 32,900 hectares (ha).

While sand supplies were adequate, the same was not true for cement and gravel and crushed stone. Cement and stone aggregates continued to be imported to Florida, although not in quantities exceeding Florida's production levels. Industry standard distances from the source to construction sites for the Nation commonly have an average transportation trucking range of 80 kilometers (km) based on economics (National Stone, Sand and Gravel Association, 2005). In Florida, more than one-half of the crushed stone aggregate comes from the southernmost part of Florida, in particular from Dade County. The remainder of Florida, then, is experiencing progressively larger transportation distances for delivery of stone aggregates, commonly up to 240 km. This, in turn, owing to increasing fuel prices, is elevating aggregate costs to the consumer. In northern Florida, although precise quantities are

¹The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending upon the mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 2004 USGS mineral production data published in this chapter are those available as of December 2005. All USGS Mineral Industry Surveys and USGS Minerals Yearbook chapters—mineral commodity, State, and country—also can be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals>.

²Values, percentage calculations, and rankings for 2003 may differ from the Minerals Yearbook, Area Reports: Domestic 2003, Volume II, owing to the revision of preliminary 2003 to final 2003 data. Data and rankings for 2004 are considered to be final and are not likely to change significantly.

³James Balsillie, Coastal/Economic Geologist, authored the text of the State mineral industry information provided by the Florida Geological Survey.

⁴A reference that includes a section mark (§) is found in the Internet Reference Cited section.

unknown, stone aggregate is arriving by barges down the Mississippi River, and by rail and ships. In addition, a shortage in qualified truck drivers is aggravating delivery accommodations, as is a shortage in qualified construction personnel in Florida's construction boom. At the currently rising aggregate production levels and because of Florida's rapid population growth, it is anticipated that the State's reserves might well be exhausted or in economic jeopardy in a relatively short period of time. The reasons include community and environmental antimineral sentiments, preemption of mining rights because of zoning or deed restrictions, and/or other litigation-related land-use constraints.

Florida's mineral resources reach beyond those of terrestrial origin or siting, especially for Florida's excessively broad continental margins in the Gulf of Mexico. FGS research on Florida's marine waters of the Gulf of Mexico has attained recognition by such agencies as the Minerals Management Service (MMS). A significant number of investigations have, during the years, been published or otherwise reported concerning offshore sediments of Florida's Gulf of Mexico. Balsillie and Clark (2001, p. 1) compiled a comprehensive treatment of the subject in a regional, subregional, and Florida county-by-county basis for marine waters of Florida's Gulf Coast. Their study was undertaken to identify what is known about potential sources of sediment for beach restoration and maintenance renourishment and, perhaps, for other task-oriented requirements. They annotated publications and reports to the extent that the user will have a grasp of the information and area of applicability of each included work.

Commodities Review

Industrial Minerals

With the understanding that Florida is among the four most population-gaining States, with some 25,500 new residents arriving monthly, it is small wonder that basic materials to support infrastructure, commercial service-providing establishments, and housing have, in turn, been affected. As in recent years, the construction industry has been hampered by an inadequate supply of materials, in particular, in shortages of aggregates, cement, and steel. In 2004, the mining and processing of basic construction materials in Florida (limestone or lime-rock aggregates whether termed gravel or crushed stone, sand, and cement) composed 55.5% of the total nonfuel valuation of all mined mineral resources or mined commodities of the State.

Cement.—High-purity limestone is used to manufacture the clinker for masonry and portland cement. Florida was a major producer and consumer of both types of cement in 2004. Whereas limestone is mined in a number of counties throughout the State, cement clinker was produced only in Alachua, Dade, Hernando, and Suwannee Counties. Cement plants, which were just grinding plants that used imported clinker, operated in Hillsborough and Manatee Counties. Rinker Materials Corporation, based in West Palm Beach, FL, has acquired seven concrete plants and a small products distribution operation in the northwestern panhandle of Florida (Crestview, Fort Walton Beach, Panama City, Panama City Beach, Pensacola, and Point Washington). Rinker officials have acquired these to expand their operations into the State's northwest where the company has not previously had an operating presence. A Rinker Corp. cement plant expansion is in the works in Hernando County, and three plants in Sumter County are in the permitting phase.

Clays.—Fuller's earth, common clays, and kaolin were mined in several locations in Florida in 2004. Fuller's earth, which was mined in Gadsden and Marion Counties, is typically used as an absorbent material; kaolin, which was mined in Putnam County, is used in the manufacture of paper and refractories. Common clays were mined mostly in Clay and Lake Counties and in small quantities from various locations throughout the State.

Phosphate Rock.—In recent years, the Florida phosphate industry was controlled by some one-half dozen companies in west-central counties of Florida (Hardee, Hillsborough, Manatee, and Polk). In 2004, however, only three companies controlled phosphate rock mining in Florida: CF Industries, Inc., PCS Phosphates, and Mosaic Company, which acquired mining interests of Cargill, Inc. and IMC Global, Inc. Nine phosphate rock mines were active in 2004, totaling some 122,000 ha, of which Mosaic Company controlled 62.6%, or 75,300 ha.

In 2004, phosphate mining activities resulted in mineral products valued at 35.8% of Florida's total nonfuel mineral production. Even so, Florida's production of phosphate rock, based on FGS estimates, accounted for approximately 75% of the U.S. production and 25% of the world's production. FGS records indicate that some 28 million metric tons of phosphate rock was extracted from Florida mines in 2004. Of note, in January, an important source of phosphate rock mining information, the Florida Phosphate Council, was disbanded; its functions have been slated to be assumed by Mosaic Company, whose corporate offices are based in Minnesota.

Metals

Titanium and Zirconium.—E.I. du Pont de Nemours & Co., Inc. and Iluka Resources, Inc. continued to operate heavy-mineral sand mines in Baker, Bradford, Clay, and Duval Counties. Ilmenite, leucoxene, rutile, and zircon are the primary minerals of interest in the heavy-mineral sand deposits of this region. Ilmenite, leucoxene, and rutile are the primary ingredients in the manufacture of titanium dioxide pigments, which, in turn, are used in the manufacture of lacquers, paint, paper, plastics, and varnish. The major uses of zircon are refractories, foundry sands, and ceramic applications.

Environmental Issues and Reclamation

In 2004, the Florida Department of Environmental Protection Bureau of Mine Reclamation issued 25 nonphosphate permits, largely Environmental Resource Permits (ERP) and Wetland Resource Permits, accounting for 2,750 ha of upland and wetland disturbance

and mine expansions and modifications. Records indicate that 64% of land mined for phosphate has been reclaimed since July 1, 1975; mined phosphate totaled more than 68,800 ha with 44,500 ha having been reclaimed.

Since July 1, 1975, Florida has required that all mined lands be reclaimed, as administered by FDEP's Bureau of Mine Reclamation. In the past 10 years, more than \$325 million has been spent on mandatory as well as other related reclamation projects. Mined land has been reclaimed for agricultural, commercial, industrial, recreational, residential purposes, and as sanctuaries for birds and other wildlife. Since 1980, more than 30 million trees have been planted on reclaimed lands. The mining companies have also donated thousands of hectares to State and public entities for recreation and wildlife habitat. The industry has continued to work with the FDEP and other State and Federal agencies to protect and to restore ecosystems and to benefit wildlife.

Governmental and Related Programs

The erosional impacts of hurricanes Charlie, Frances, Ivan, and Jeanne on the coasts of Florida in 2004, resulted in resounding responses from Federal and State Governments. In 2004, the Florida Legislature added an emergency appropriation of \$68.4 million to its \$30 million annual expenditure level for beach restoration. These funds are, in part, used to cost-share with local governments and with the U.S. Army Corps of Engineers funding of more than \$160 million for some 15 Florida beach restoration projects. While most of the funding is used in design phases, dredging and pumping activities, part of this total funding is used for conducting sand search studies in offshore waters. Marine sources of sand for restoration work have been the norm for decades because upland sources have become diminished and/or not economic.

The FGS and the MMS have entered into a multiyear cooperative agreement (cooperative agreement # 1435-0001-30757) with the specific goal of locating and characterizing the areal extent and volume of available sands suitable for beach nourishment lying in Federal waters adjacent to State submerged lands off the northeast coast of Florida. In the second year of this study, 306 km of seismic data were collected offshore Nassau, Duval, and Flagler Counties (Florida Geological Survey, unpub. data). These data were subsequently processed, interpreted, and integrated with the data collected in the first year. A total of 52 vibracores was collected offshore Nassau and Duval Counties. Initial analysis of all vibracore data available for inclusion in FGS-MMS report infers potential reserves of up to 152 million cubic meters of restoration-quality sand offshore southern Duval County. It is anticipated that the analysis of planned vibracores to be obtained for the third year report will facilitate the quality and quantity of potential reserves offshore northern Duval County and all of Nassau County.

The fourth annual Mining Day took place at Florida's State Capitol in 2004. This event was jointly sponsored by the aggregates, phosphate, heavy-minerals, and clay industries in Florida in an attempt to bring awareness of the importance of mining to decisionmakers. Also participating were representatives with presentations from the FDEP's Bureau of Mine Reclamation and the FGS. Some 21 legislative offices were represented, and participants answered inquiries about what makes mining the "backbone of Florida's future" (Florida Limerock and Aggregate Institute, 2004).

The aggregates industry, principally through the Florida Limerock and Aggregate Institute, has been instrumental in conducting a public education program in the elementary schools of Florida communities (Florida Limerock and Aggregate Institute, 2004). This program has received the approval of the State's Department of Education science curriculum section. The program goal is to enhance the science curriculum with more mineral science and mining recognition at the fourth grade level. It is currently targeted to mining areas where the children can be educated as to the work their parents perform and importance of local resources. The program is supported by volunteers from local aggregate mining companies who will donate classroom materials and provide mentoring assistance. In 2004, four schools were engaged in Clermont and Lake County, and five schools, three gifted programs, and a county board of education were engaged in Brooksville, Hernando County. More information about this program and its success can be found on the Web site at URL <http://www.flai.org>.

As part of an ongoing cooperative effort through the STATEMAP component of the National Cooperative Geologic Mapping Program (a USGS-State of Florida-FGS jointly funded program), in 2004, the FGS completed geologic mapping for the eastern portion of the USGS 1:100,000-scale Gainesville quadrangle and completed the final maps and cross sections for the same area. The completed maps and cross sections are available as part of the FGS Open-File Map Series (Evans and others, 2004).

References Cited

- Balsillie, J.H., and Clark, R.R., 2001, Annotated and illustrated bibliography of marine subaqueous sand resources of Florida's Gulf of Mexico, 1942-1997: Florida Geological Survey Special Publication No. 48, 254 p.
- Evans, W.L., III, Green, R.C., Bryan, J.R., and Paul, D.T., 2004, Geologic map of the western portion of the U.S.G.S. 1:100,000-scale Gainesville Quadrangle, northern Florida: Florida Geological Survey Open-File Map Series No. 93, 2 plates.
- Florida Limerock and Aggregate Institute, 2004, Mining day at the State Capitol 2004: FLAI Flavor, Florida Limerock and Aggregate Institute, v. 3, no. 1, May-June, 4 p.
- National Stone, Sand and Gravel Association, 2005, 50 fascinating facts about stone, sand and gravel: National Stone, Sand and Gravel Association, brochure, 6 p. (Also available at <http://www.nssgs.org>).

Internet Reference Cited

- Mining Safety and Health Administration, 2004, MSHA data file downloads, Preliminary data files for 2004, accessed August 21, 2005, at URL <http://www.cdc.gov/niosh/mining/data/mshadata.html>.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN FLORIDA^{1,2}

(Thousand metric tons and thousand dollars)

Mineral	2002		2003		2004	
	Quantity	Value	Quantity	Value	Quantity	Value
Cement:						
Masonry	591	64,000 ^e	674	82,900 ^e	763	97,600 ^e
Portland	3,950	297,000 ^e	4,190	323,000 ^e	5,230	432,000 ^e
Clays:						
Common	W	W	94 ^e	1,280 ^e	W	W
Fuller's earth	W	W	W	W	234	W
Kaolin	32	3,370	31	3,250	31	3,280
Gemstones	NA	1	NA	1	NA	1
Lime	--	--	--	--	24	2,090
Peat	559	11,500	373	7,440	478	9,710
Sand and gravel:						
Construction	26,400	114,000	30,900	141,000	29,300	146,000
Industrial	645	8,640	624	7,270	679	8,520
Stone, crushed	97,700	573,000	97,100	587,000	105,000	675,000
Combined values of magnesium compounds, phosphate rock, staurolite, titanium concentrates, zirconium concentrates, and values indicated by symbol W						
	XX	963,000	XX	918,000	XX	945,000
Total	XX	2,030,000	XX	2,070,000	XX	2,320,000

^eEstimated. NA Not available. W Withheld to avoid disclosing company proprietary data. Withheld values included in "Combined values" data.
XX Not applicable. -- Zero.

¹Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

²Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 2
FLORIDA: CRUSHED STONE SOLD OR USED, BY KIND¹

Kind	2002				2003				2004			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone ²	76	95,900	\$561,000	\$5.85	72	94,000	\$567,000	\$6.03	78	103,000	\$663,000	\$6.43
Dolomite	5	1,200	8,540	7.13	5	1,880	12,500	6.64	4	1,030	6,490	6.32
Shell	3	611	3,900	6.38	3	1,250	7,620	6.09	3	1,150	6,110	5.34
Total or average	XX	97,700	573,000	5.87	XX	97,100	587,000	6.04	XX	105,000	675,000	6.42

XX Not applicable.

¹Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.

²Includes limestone-dolomite reported with no distinction between the two.

TABLE 3a
 FLORIDA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2003, BY USE¹

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Construction:			
Coarse aggregate (+1½ inch):			
Macadam	W	W	\$13.23
Riprap and jetty stone	37	\$393	10.62
Filter stone	W	W	5.03
Other coarse aggregates	422	4,430	10.50
Total or average	459	4,830	10.51
Coarse aggregate, graded:			
Concrete aggregate, coarse	1,510	11,400	7.54
Bituminous aggregate, coarse	(2)	(2)	4.83
Bituminous surface-treatment aggregate	(2)	(2)	5.51
Other graded coarse aggregates	10,100	103,000	10.28
Total or average	11,600	115,000	9.92
Fine aggregate (-¾ inch):			
Stone sand, concrete	(3)	(3)	4.83
Screening, undesignated	3,820	24,600	6.43
Other fine aggregates	8,830	68,100	7.71
Total or average	12,700	92,700	7.33
Coarse and fine aggregates:			
Graded road base or subbase	14,600	52,300	3.59
Unpaved road surfacing	(4)	(4)	5.24
Crusher run or fill or waste	1,320	6,360	4.82
Other coarse and fine aggregates	3,020	20,900	6.90
Total or average	18,900	79,500	4.20
Other construction materials	599	2,110	3.53
Agricultural limestone	(5)	(5)	6.53
Chemical and metallurgical, cement manufacture	(5)	(5)	4.41
Other miscellaneous uses and specified uses not listed	613	2,790	4.55
Unspecified:⁶			
Reported	40,300	230,000	5.71
Estimated	9,100	46,000	5.12
Total or average	49,400	277,000	5.60
Grand total or average	97,100	587,000	6.04

W Withheld to avoid disclosing company proprietary data; included with "Other coarse aggregates."

¹Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.

²Withheld to avoid disclosing company proprietary data; included with "Other graded coarse aggregates."

³Withheld to avoid disclosing company proprietary data; included with "Other fine aggregates."

⁴Withheld to avoid disclosing company proprietary data; included with "Other coarse and fine aggregates."

⁵Withheld to avoid disclosing company proprietary data; included in "Grand total or average."

⁶Reported and estimated production without a breakdown by end use.

TABLE 3b

FLORIDA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2004, BY USE¹

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Construction:			
Coarse aggregate (+1½ inch):			
Macadam	W	W	\$13.78
Riprap and jetty stone	151	\$1,580	10.48
Filter stone	W	W	14.88
Other coarse aggregates	988	11,100	11.21
Total or average	1,140	12,700	11.11
Coarse aggregate, graded:			
Concrete aggregate, coarse	3,330	25,000	7.49
Bituminous aggregate, coarse	(2)	(2)	4.90
Bituminous surface-treatment aggregate	(2)	(2)	6.06
Railroad ballast	(2)	(2)	5.51
Other graded coarse aggregates	14,000	154,000	10.95
Total or average	17,400	179,000	10.29
Fine aggregate (-¾ inch):			
Stone sand, concrete	(3)	(3)	5.15
Stone sand, bituminous mix or seal	(3)	(3)	6.06
Screening, undesignated	1,600	11,700	7.30
Other fine aggregates	13,500	102,000	7.56
Total or average	15,100	114,000	7.53
Coarse and fine aggregates:			
Graded road base or subbase	17,400	73,300	4.21
Crusher run or fill or waste	1,600	6,590	4.12
Other coarse and fine aggregates	1,370	9,660	7.04
Total or average	20,400	89,600	4.39
Other construction materials	696	2,460	3.53
Agricultural limestone	401	2,820	7.03
Chemical and metallurgical, cement manufacture	4,960	22,100	4.46
Other miscellaneous uses and specified uses not listed	2	17	8.50
Unspecified:⁴			
Reported	39,800	229,000	5.74
Estimated	5,300	24,000	4.57
Total or average	45,200	253,000	5.60
Grand total or average	105,000	675,000	6.42

W Withheld to avoid disclosing company proprietary data; included with "Other coarse aggregates."

¹Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.

²Withheld to avoid disclosing company proprietary data; included with "Other graded coarse aggregates."

³Withheld to avoid disclosing company proprietary data; included with "Other fine aggregates."

⁴Reported and estimated production without a breakdown by end use.

TABLE 4a
 FLORIDA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2003, BY USE AND DISTRICT¹

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1½ inch) ²	W	W	W	W	29	356
Coarse aggregate, graded ³	W	W	W	W	4,620	50,700
Fine aggregate (-¾ inch) ⁴	W	W	W	W	3,250	26,900
Coarse and fine aggregate ⁵	329	2,810	7,100	27,900	3,800	21,600
Other construction materials	--	--	--	--	--	--
Agricultural ⁶	W	W	W	W	W	W
Chemical and metallurgical ⁷	--	--	--	--	W	W
Other miscellaneous uses and specified uses not listed	--	--	613	2,790	--	--
Unspecified:⁸						
Reported	2,220	11,100	4,120	19,300	12,800	77,200
Estimated	840	4,100	2,300	11,000	1,900	9,900
Total	3,850	25,300	14,600	66,000	28,300	196,000
District 4						
	Quantity	Value				
Construction:						
Coarse aggregate (+1½ inch) ²	W	W				
Coarse aggregate, graded ³	W	W				
Fine aggregate (-¾ inch) ⁴	9,190	62,500				
Coarse and fine aggregates ⁵	7,700	27,200				
Other construction materials	599	2,110				
Agricultural ⁶	--	--				
Chemical and metallurgical ⁷	W	W				
Other miscellaneous uses and specified uses not listed	--	--				
Unspecified:⁸						
Reported	21,100	123,000				
Estimated	4,100	21,000				
Total	50,300	300,000				

W Withheld to avoid disclosing company proprietary data; included in "Total." -- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregates.

³Includes bituminous aggregate (coarse), bituminous surface-treatment aggregate, concrete aggregate (coarse), and other graded aggregates.

⁴Includes screening (undesignated), stone sand (concrete), and other fine aggregates.

⁵Includes crusher run (select material or fill), graded road base or subbase, unpaved road surfacing, and other coarse and fine aggregates.

⁶Includes agricultural limestone.

⁷Includes cement manufacture.

⁸Reported and estimated production without a breakdown by end use.

TABLE 4b
 FLORIDA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2004, BY USE AND DISTRICT¹

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1½ inch) ²	W	W	W	W	346	2,250
Coarse aggregate, graded ³	W	W	W	W	6,650	73,600
Fine aggregate (-¾ inch) ⁴	W	W	W	W	4,810	39,900
Coarse and fine aggregate ⁵	1,230	6,940	9,390	42,600	1,000	4,740
Other construction materials	--	--	--	--	--	--
Agricultural ⁶	W	W	W	W	W	W
Chemical and metallurgical ⁷	--	--	--	--	W	W
Other miscellaneous uses and specified uses not listed	--	--	2	17	--	--
Unspecified:⁸						
Reported	2,270	11,300	4,690	21,700	9,480	61,000
Estimated	750	3,400	770	3,300	2,200	9,500
Total	4,880	32,000	15,600	74,700	28,200	208,000
District 4						
	Quantity	Value				
Construction:						
Coarse aggregate (+1½ inch) ²	W	W				
Coarse aggregate, graded ³	10,100	95,800				
Fine aggregate (-¾ inch) ⁴	9,940	71,000				
Coarse and fine aggregates ⁵	8,760	35,300				
Other construction materials	696	2,460				
Agricultural ⁶	--	--				
Chemical and metallurgical ⁷	W	W				
Other miscellaneous uses and specified uses not listed	--	--				
Unspecified:⁸						
Reported	23,400	135,000				
Estimated	1,600	8,200				
Total	56,600	360,000				

W Withheld to avoid disclosing company proprietary data; included in "Total." -- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregates.

³Includes bituminous aggregate (coarse), bituminous surface-treatment aggregate, concrete aggregate (coarse), railroad ballast, and other graded aggregates.

⁴Includes screening (undesignated), stone sand (bituminous mix or seal), stone sand (concrete), and other fine aggregates.

⁵Includes crusher run or fill or waste, graded road base or subbase, and other coarse and fine aggregates.

⁶Includes agricultural limestone.

⁷Includes cement manufacture.

⁸Reported and estimated production without a breakdown by end use.

TABLE 5a
 FLORIDA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2003,
 BY MAJOR USE CATEGORY¹

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	7,180	\$39,300	\$5.47
Concrete products (blocks, bricks, pipe, decorative, etc.) ²	953	4,850	5.09
Asphaltic concrete aggregates and road base materials	1,270	5,140	4.02
Fill	3,600	6,580	1.83
Other miscellaneous uses	570	2,320	4.07
Unspecified: ³			
Reported	11,100	57,800	5.19
Estimated	6,200	25,000	4.04
Total or average	30,900	141,000	4.56

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes plaster and gunite sands.

³Reported and estimated production without a breakdown by end use.

TABLE 5b
 FLORIDA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2004,
 BY MAJOR USE CATEGORY¹

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	9,550	\$62,400	\$6.54
Plaster and gunite sands	951	5,380	5.65
Asphaltic concrete aggregates and road base materials	724	3,170	4.37
Fill	3,130	7,280	2.33
Other miscellaneous uses	701	4,390	6.26
Unspecified: ²			
Reported	7,430	34,400	4.63
Estimated	6,800	29,000	4.29
Total or average	29,300	146,000	4.99

¹Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.

²Reported and estimated production without a breakdown by end use.

TABLE 6a

FLORIDA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2003, BY USE AND DISTRICT¹

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products ²	470	2,040	W	W	W	W
Asphaltic concrete aggregates and road base materials	--	--	W	W	W	W
Fill	550	1,250	1,350	1,490	1,700	3,830
Other miscellaneous uses	4	16	5,450	30,100	4,050	19,500
Unspecified: ³						
Reported	489	2,440	6,060	32,400	4,590	23,000
Estimated	1,800	7,100	2,800	12,000	1,000	4,200
Total	3,350	12,900	15,600	75,500	11,300	50,400
	District 4					
	Quantity	Value				
Concrete aggregate and concrete products ²	--	--				
Asphaltic concrete aggregates and other bituminous mixtures	--	--				
Fill	--	--				
Other miscellaneous uses	--	--				
Unspecified: ³	--	--				
Reported	--	--				
Estimated	590	2,100				
Total	590	2,100				

W Withheld to avoid disclosing company proprietary data; included in "Other miscellaneous uses." -- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.²Includes plaster and gunite sands.³Reported and estimated production without a breakdown by end use.

TABLE 6b

FLORIDA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2004, BY USE AND DISTRICT¹

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregates (including concrete sand) ²	W	W	W	W	3,140	18,900
Asphaltic concrete aggregates and road base materials	--	--	W	W	W	W
Fill	350	386	11	42	2,770	6,850
Other miscellaneous uses	288	1,200	7,350	49,400	1,150	5,900
Unspecified: ³						
Reported	173	793	1,570	7,820	5,690	25,800
Estimated	2,000	8,500	2,900	13,000	1,100	5,000
Total	2,830	10,900	11,800	69,900	13,900	62,500
	District 4					
	Quantity	Value				
Concrete aggregates (including concrete sand) ²	--	--				
Asphaltic concrete aggregates and road base materials	--	--				
Fill	--	--				
Other miscellaneous uses	--	--				
Unspecified: ³						
Reported	--	--				
Estimated	790	3,100				
Total	790	3,100				

W Withheld to avoid disclosing company proprietary data; included in "Other miscellaneous uses." -- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.²Includes plaster and gunite sands.³Reported and estimated production without a breakdown by end use.